

REMARKS

I. STATUS OF THE CLAIMS

Claims 1-51 are currently pending.

Original claims 1, 7, 8, 14, 15, 16, 17 and 18 are amended herein.

More specifically, claims 1, 7, 8, 14, 15, 16, 17 and 18 are amended herein to recite "by Raman scattering". Support for "by Raman scattering" is found by comparing FIGS. 2, 9 and 10 with FIGS. 11 and 12. For example, FIGS. 2, 9 and 10 show a rare earth-doped optical fiber 11. The rare earth-doped optical fiber 11 can be used, for example, for an erbium doped fiber amplifier (EDFA). In comparison, FIGS. 11 and 12 show an optical fiber 51. As would be understood by a person of ordinary skill in the art, especially from a comparison of the rare earth-doped optical fiber 11 FIGS. 2, 9 and 10 to optical fiber 51 in FIGS. 11 and 12, optical fiber 51 is not a rare earth-doped optical fiber. Accordingly, as would be understood by a person of ordinary skill in the art, optical fiber 51 can be used for Raman scattering.

Claims 1, 7, 8, 14, 15, 16, 17 and 18 are also amended to change the word "via" to instead be "and" in some parts, and to amend "via" to instead be "by a" in other parts, and to also change "connected" to instead be "coupled" in some parts. Support for the amendments is found, for example, in FIGS. 11 and 12.

New claims 19-51 are added herein, and correspond, respectively, to new claims 19-51 that were added in the reissue application when it was filed on October 16, 2003. However, the independent claims 19, 27, 34, 47, 49 and 51 are amended herein with respect to these claims as presented in the reissue application when it was filed on October 16, 2003.

The changes to independent claims 19, 27, 34, 47, 49 and 51 as presented herein with respect to these claims as presented in the reissue application when it was filed on October 16, 2006, are that, for example, "by Raman scattering" is added to claims 19 and 27, "Raman" is added to claim 34, and "for Raman scattering" is added to claims 47, 49 and 51. Support for "by Raman scattering" is indicated above. The portions of the application that provide support for "by Raman scattering" also provide support for "Raman" and "for Raman scattering".

Independent claims 19, 27, 34, 47, 49 and 51 are also amended herein with respect to the claims as presented in the reissue application when it was filed on October 16, 2003, to change, for example, the word "via" to instead be "and" in some parts, and to change the word "via" to instead be "by a" in other parts, and to also change "connected" to instead be "coupled" in some parts. Support for the amendments is found, for example, in FIGS. 11 and 12.

Support for remaining portions of claims 19-51 is indicated below.

Claim 19 recites an apparatus comprising: an optical splitter (see, for example, splitter 15

in FIG. 11, and the disclosure in column 11, lines 42-54, of the specification) splitting off a portion of an input light having been amplified by Raman scattering as the input light traveled through an optical fiber (see, for example, optical fiber 51 in FIG. 11, and the disclosure in column 11, lines 42-54, of the specification) and a first pumping light (see, for example, excitation light from light source 52 in FIG. 11, and the disclosure in column 11, lines 42-54, of the specification) traveling through the optical fiber in an opposite direction than the input light, the first pumping light being controlled in accordance with a monitored optical power of said split portion (see, for example, control circuit 56 in FIG. 11, and the disclosure in column 11, lines 42-54, of the specification); and an optical fiber amplifier (see, for example, optical fiber 12 in FIG. 11, and the disclosure in column 11, lines 42-54, of the specification), optically coupled to the optical splitter, amplifying the input light having said portion split off therefrom by a second pumping light (see, for example, excitation light from light source 54 in FIG. 11, and the disclosure in column 11, lines 42-54, of the specification).

Claim 20 recites that the optical fiber amplifier is a rare earth-doped optical fiber amplifier (see, for example, optical fiber 12 in FIG. 11, and the disclosure in column 11, lines 42-54, of the specification).

Claim 21 recites optical isolator between the optical splitter and the optical fiber amplifier (see, for example, optical isolator 21c in FIG. 11, and the disclosure in column 11, lines 62-65, of the specification).

Claim 22 recites a monitor monitoring the optical power of said split portion, to thereby provide said monitored optical power (see, for example, photodiode 16 and control circuit 56 in FIG. 11, and the disclosure in column 11, lines 52-54, of the specification).

Claim 23 recites a monitor monitoring the optical power of said split portion, to thereby provide said monitored optical power (see, for example, photodiode 16 and control circuit 56 in FIG. 11, and the disclosure in column 11, lines 52-54, of the specification).

Claim 24 recites a monitor monitoring the optical power of said split portion, to thereby provide said monitored optical power (see, for example, photodiode 16 and control circuit 56 in FIG. 11, and the disclosure in column 11, lines 52-54, of the specification).

Claim 25 recites that the optical fiber is an erbium doped fiber (see, for example, column 11, lines 51-52, of the specification).

Claim 26 recites that there are no optical components between the optical splitter and the optical fiber amplifier (see, for example, FIGS. 2, 6, 9 and 10, where there are no optical components between splitter 15 and the input to optical fiber 12).

Claim 27 recites an optical splitter (see, for example, splitter 15 in FIG. 11, and the

disclosure in column 11, lines 42-54, of the specification) splitting off a portion of an input light having been amplified by Raman scattering as the input light traveled through an optical fiber (see, for example, optical fiber 51 in FIG. 11, and the disclosure in column 11, lines 42-54, of the specification) and a first pumping light (see, for example, excitation light from light source 52 in FIG. 11, and the disclosure in column 11, lines 42-54, of the specification) traveling through the optical fiber in an opposite direction than the input light, the first pumping light being controlled in accordance with a monitored optical power of said split portion (see, for example, control circuit 56 in FIG. 11, and the disclosure in column 11, lines 42-54, of the specification); and an optical fiber amplifier (see, for example, optical fiber 12 in FIG. 11, and the disclosure in column 11, lines 42-54, of the specification) amplifying the input light having said portion split off therefrom by a second pumping light (see, for example, excitation light from light source 54 in FIG. 11, and the disclosure in column 11, lines 42-54, of the specification).

Claim 28 recites that the optical fiber amplifier is a rare earth-doped optical fiber amplifier (see, for example, optical fiber 12 in FIG. 11, and the disclosure in column 11, lines 42-54, of the specification).

Claim 29 recites an optical isolator between the optical splitter and the optical fiber amplifier (see, for example, optical isolator 21c in FIG. 11, and the disclosure in column 11, lines 62-65, of the specification).

Claim 30 recites a monitor monitoring the optical power of said split portion, to thereby provide said monitored optical power (see, for example, photodiode 16 and control circuit 56 in FIG. 11, and the disclosure in column 11, lines 52-54, of the specification).

Claim 31 recites a monitor monitoring the optical power of said split portion, to thereby provide said monitored optical power (see, for example, photodiode 16 and control circuit 56 in FIG. 11, and the disclosure in column 11, lines 52-54, of the specification).

Claim 32 recites that the optical fiber is an erbium doped fiber (see, for example, column 11, lines 51-52, and column 4, lines 46-48, of the specification).

Claim 33 recites that there are no optical components between the optical splitter and the optical fiber amplifier (see, for example, FIGS. 2, 6, 9 and 10, where there are no optical components between splitter 15 and the input to optical fiber 12).

Claim 34 recites an optical splitter (see, for example, splitter 15 in FIG. 11, and the disclosure in column 11, lines 42-54, of the specification) splitting off a portion of an input light having been Raman amplified by a first pumping light (see, for example, excitation light from light source 52 in FIG. 11, and the disclosure in column 11, lines 42-54, of the specification) traveling in an opposite direction than, and along the same travel path as, the input light, the first pumping

light being controlled in accordance with a monitored optical power of said split portion (see, for example, control circuit 56 in FIG. 11, and the disclosure in column 11, lines 42-54, of the specification); and an optical fiber amplifier (see, for example, optical fiber 12 in FIG. 11, and the disclosure in column 11, lines 42-54, of the specification), optically coupled to the optical splitter, amplifying the input light having said portion split off therefrom by a second pumping light (see, for example, excitation light from light source 54 in FIG. 11, and the disclosure in column 11, lines 42-54, of the specification).

Claim 35 recites an optical isolator between the optical splitter and the optical fiber amplifier (see, for example, optical isolator 21c in FIG. 11, and the disclosure in column 11, lines 62-65, of the specification).

Claim 36 recites a monitor monitoring the optical power of said split portion, to thereby provide said monitored optical power (see, for example, photodiode 16 and control circuit 56 in FIG. 11, and the disclosure in column 11, lines 52-54, of the specification).

Claim 37 recites a monitor monitoring the optical power of said split portion, to thereby provide said monitored optical power (see, for example, photodiode 16 and control circuit 56 in FIG. 11, and the disclosure in column 11, lines 52-54, of the specification).

Claim 38 recites that there are no optical components between the optical splitter and the optical fiber amplifier (see, for example, FIGS. 2, 6, 9 and 10, where there are no optical components between splitter 15 and the input to optical fiber 12).

Claim 39 recites that the optical fiber is doped with a rare earth element (see, for example, column 11, lines 51-52, of the specification).

Claim 40 recites that the optical fiber is doped with a rare earth element (see, for example, column 11, lines 51-52, of the specification).

Claim 41 recites that the optical fiber is doped with a rare earth element (see, for example, column 11, lines 51-52, and column 4, lines 46-48, of the specification).

Claim 42 recites that the optical fiber is doped with a rare earth element (see, for example, column 11, lines 51-52, of the specification).

Claim 43 recites that the optical fiber is doped with a rare earth element (see, for example, column 11, lines 51-52, of the specification).

Claim 44 recites that the optical fiber is doped with a rare earth element (see, for example, column 11, lines 51-52, of the specification).

Claim 45 recites that the optical fiber is doped with a rare earth element (see, for example, column 11, lines 51-52, of the specification).

Claim 46 recites that the optical fiber is doped with a rare earth element (see, for

example, column 11, lines 51-52, of the specification).

Claim 47 recites an apparatus for receiving an optical signal transmitted through an optical fiber (see, for example, optical fiber 51 in FIG. 11, and the disclosure in column 11, lines 42-54, of the specification) in a first direction, comprising: a pumping light source to output a pumping light to the optical fiber so that the pumping light travels through the optical fiber in a second direction opposite to the first direction for Raman scattering (see, for example, excitation light from light source 52 in FIG. 11, and the disclosure in column 11, lines 42-54, of the specification); an optical coupler (see, for example, splitter 15 in FIG. 11, and the disclosure in column 11, lines 42-54, of the specification) to receive the optical signal from the optical fiber and to output the received optical signal and a monitor signal of the received optical signal, the pumping light source being controlled in accordance with the monitor signal to thereby control the pumping light output by the pumping light source (see, for example, control circuit 56 in FIG. 11, and the disclosure in column 11, lines 42-54, of the specification); and an optical amplifier to amplify the received optical signal output from the optical coupler (see, for example, optical fiber 12 in FIG. 11, and the disclosure in column 11, lines 42-54, of the specification).

Claim 48 recites that the optical fiber is doped with a rare earth element (see, for example, column 11, lines 51-52, of the specification).

Claim 49 recites an optical transmitting station (inherent upstream of connector 20a in FIG. 11) to transmit an optical signal through an optical fiber in a first direction; and an optical repeater (see, for example, column 1, lines 23-26, and column 7, lines 32-34, of the specification), coupled to the optical fiber. Claim 49 recites that the optical repeater includes a pumping light source to output a pumping light to the optical fiber so that the pumping light travels through the optical fiber in a second direction opposite to the first direction for Raman scattering (see, for example, excitation light from light source 52 in FIG. 11, and the disclosure in column 11, lines 42-54, of the specification), an optical coupler (see, for example, splitter 15 in FIG. 11, and the disclosure in column 11, lines 42-54, of the specification) to receive the optical signal from the optical fiber and to output the received optical signal and a monitor signal of the received optical signal, the pumping light source being controlled in accordance with the monitor signal to thereby control the pumping light output by the pumping light source (see, for example, control circuit 56 in FIG. 11, and the disclosure in column 11, lines 42-54, of the specification) and an optical amplifier (see, for example, optical fiber 12 in FIG. 11, and the disclosure in column 4, line 1, and column 11, lines 42-54, of the specification) to amplify the received optical signal from the optical coupler and to output the amplified optical signal.

Claim 50 recites that the optical fiber is doped with an rare earth element (see, for

example, column 11, lines 51-52, of the specification).

Claim 51 recites an optical repeater (see, for example, column 1, lines 23-26, and column 7, lines 32-34, of the specification), coupled to an optical fiber (see, for example, optical fiber 51 in FIG. 11, and the disclosure in column 11, lines 42-54, of the specification) through which an optical signal is transmitted in a first direction, including: a pumping light source (see, for example, excitation light from light source 52 in FIG. 11, and the disclosure in column 11, lines 42-54, of the specification) to output a pumping light to the optical fiber so that the pumping light travels through the optical fiber in a second direction opposite to the first direction for Raman scattering, an optical coupler (see, for example, splitter 15 in FIG. 11, and the disclosure in column 11, lines 42-54, of the specification) to receive the optical signal from the optical fiber and to output the received optical signal and a monitor signal of the received optical signal, the pumping light source being controlled in accordance with the monitor signal to thereby control the pumping light output by the pumping light source (see, for example, control circuit 56 in FIG. 11, and the disclosure in column 11, lines 42-54, of the specification), and an optical amplifier (see, for example, optical fiber 12 in FIG. 11, and the disclosure in column 11, lines 42-54, of the specification) to amplify the received optical signal output from the optical coupler; and an optical receiver (inherent downstream of connector 20b in FIG. 11), operatively coupled to the optical repeater, to receive the amplified optical signal.

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Various portions of the application are set forth herein as providing support for various claim recitations. However, the claims are not limited to being supported by these portions of the application. Instead, other portions of the application may also provide support for the claim recitations.

II. REJECTION OF CLAIMS 17, 18, 45 AND 46 UNDER 35 USC 112, SIXTH PARAGRAPH

The Office Action indicates that the rejection can be overcome if the Applicant indicates where support in the application can be found for the "means for splitting off" recited in claims 17 and 18.

Support for the "means for splitting off" recited in claims 17 and 18 is shown, for example, by splitter 15 in FIG. 11, and the disclosure in column 11, lines 42-54, of the application.

In view of the above, it is respectfully submitted that the rejection is overcome.

III. CONCLUSION

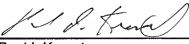
In view of the above, it is respectfully submitted that the application is in condition for allowance, and a Notice of Allowance is earnestly solicited.

If any further fees are required in connection with the filing of this response, please charge the fees to our Deposit Account No. 19-3935.

Respectfully submitted,

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Date: September 1, 2011

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